

REMARKS

Reconsideration and allowance of the present patent application based on the foregoing amendments and following remarks are respectfully requested.

By this Amendment, claims 1-5, 8, 12, 20-21, 23-26 and 31 are amended, and claim 28 is cancelled without prejudice or disclaimer to the subject matter therein. Claims 32 and 33 are withdrawn from further consideration as being directed to a non-elected invention. Support for the amendments to the claims may be found, for example, in the embodiments shown in FIGS. 2 and 3 of the present patent application. No new matter has been added. Accordingly, after entry of this Amendment, claims 1-27 and 29-33 will remain pending in the patent application.

In the Office Action, claim 28 was objected to. In response, claim 28 is cancelled without prejudice or disclaimer, thus rendering moot the rejection of this claim.

Claims 1, 23-24 and 28 were rejected under 35 U.S.C. §102(b) based on Piwczyk (U.S. Pat. No. 4,801,352). The rejection is respectfully traversed.

Claim 1 is patentable over Piwczyk at least because this claim recites a lithographic projection apparatus comprising, *inter alia*, a support structure constructed and arranged to support a patterning structure, the patterning structure constructed and arranged to pattern the beam of radiation according to a desired pattern; a projection system constructed and arranged to project the patterned beam of radiation onto a target portion of the substrate; and a gas flushing system comprising a radial gas flow outlet arranged proximate an inner side of the gas flushing system that is adjacent a path of the patterned beam of radiation, the gas flushing system constructed and arranged to generate a radial gas flow through the radial gas flow outlet in an intermediate space defined between the gas flushing system and the substrate, wherein the radial gas flow has a radial velocity directed outwards in the space with a magnitude greater than zero at every location in the space. Piwczyk does not disclose, teach or suggest these features.

Piwczyk discloses a system that provides a controlled gas environment against a selected area of a surface of a substrate for processing that area of the surface, without immersing the entire substrate in the gas environment. (*See* Piwczyk, col. 4, lines 10-14).

However, unlike claim 1, Piwczyk does not disclose, teach or suggest a support structure constructed and arranged to support a patterning structure and a projection system constructed and arranged to project a patterned beam of radiation onto a target portion of the

substrate. Piwczyk merely discloses an apparatus that carries out deposition, implantation, etching, ablation and other radiation induced chemical processes. (See Piwczyk, col. 6, lines 49-64 and FIGS. 1-18). However, none of the embodiments disclosed in Piwczyk involve a support structure constructed and arranged to support a patterning structure or a projection system constructed and arranged to project a patterned beam. As such, for at least these reasons, Piwczyk does not disclose, teach or suggest each and every element recited by claim 1 and, as a result, cannot anticipate claim 1.

Furthermore, unlike claim 1, Piwczyk is silent as to a gas flushing system comprising a radial gas flow outlet arranged proximate an inner side of the gas flushing system that is adjacent a path of the beam of radiation, the gas flushing system constructed and arranged to generate a radial gas flow through the radial gas flow outlet in an intermediate space defined between the gas flushing system and the substrate, wherein the radial gas flow has a radial velocity directed outwards in the space with a magnitude greater than zero at every location in the space.

Piwczyk merely discloses a flowing gas enclosure 1 that includes inner annular grooves 14 (identified in the Office Action as the “radial gas flow outlet” of claim 1) and outer annular grooves 15. However, in contrast to claim 1, Piwczyk discloses in FIGS. 5 and 6 that the gas flow output by the inner annular grooves 14 is directed inwards in the space between the enclosure 1 and the substrate 2. As can be seen in FIGS. 5 and 6, when the inner annular grooves 14 are configured to supply gas in the space between the enclosure 1 and the substrate 2, the supplied gas is directed towards the inner space 3 of the enclosure 1 due to the pressure difference between the gas in the inner annular grooves 14 (high pressure area) and the gas in the inner space 3 (low pressure area). Piwczyk is silent as to directing the gas flow output by the inner annular grooves 14 (radially) outwards in the space between the enclosure 1 and the substrate. Therefore, for at least this reason, Piwczyk does not disclose, teach or suggest each and every feature recited by claim 1 and, as a result, cannot anticipate claim 1.

Claim 23 is patentable over Piwczyk for at least similar reasons as provided above for claim 1. Namely, claim 23 is patentable at least because this claim recites a method of manufacturing a device comprising, *inter alia*, flowing a radial flushing gas with a gas flushing system from a radial gas flow outlet arranged proximate an inner side of the gas flushing system that is adjacent a path of the beam of radiation toward an outer part of the substrate in an intermediate space between the gas flushing system and the substrate. As mentioned similarly previously, Piwczyk is silent as to these features. Piwczyk merely

discloses directing gas from the inner annular grooves 14 towards the inner space 3 of the enclosure 1. For at least this reason, Applicants respectfully submit that claim 23 cannot be anticipated by Piwczyk.

Claim 24 is patentable over Piwczyk at least by virtue of its dependency from claim 23 and for the additional features recited therein.

Claim 28 is cancelled without prejudice or disclaimer, thus rendering moot the rejection of claim 28.

Accordingly, reconsideration and withdrawal of the rejection of claims 1, 23-24 and 28 under 35 U.S.C. §102(b) based on Piwczyk are respectfully requested.

Claims 1-31 were rejected under 35 U.S.C. §103(a) based on Hasegawa *et al.* (U.S. Pat. No. 6,721,031) (hereinafter "Hasegawa") in view of Piwczyk. The rejection is respectfully traversed.

Claim 1 recites a lithographic projection apparatus comprising, *inter alia*, a gas flushing system comprising a radial gas flow outlet arranged proximate an inner side of the gas flushing system that is adjacent a path of the patterned beam of radiation, the gas flushing system constructed and arranged to generate a radial gas flow through the radial gas flow outlet in an intermediate space defined between the gas flushing system and the substrate, wherein the radial gas flow has a radial velocity directed outwards in the space with a magnitude greater than zero at every location in the space.

As conceded by the Examiner on page 5, lines 3-5 of the Office Action, Hasegawa does not disclose, teach or suggest the gas flushing system as recited in claim 1. The Examiner then relied on Piwczyk as allegedly teaching the recited gas flushing system. Applicants respectfully disagree.

As mentioned previously, Piwczyk merely discloses that when the inner annular grooves 14 are configured to supply gas in the space between the enclosure 1 and the substrate 2, the supplied gas is directed towards the inner space 3 of the enclosure 1 due to the pressure difference between the gas in the inner annular grooves 14 and the gas in the inner space 3. Thus, Piwczyk is silent as to a gas flushing system configured to generate a radial gas flow through the radial gas flow outlet in an intermediate space defined between the gas flushing system and the substrate, wherein the radial gas flow has a radial velocity directed outwards in the space with a magnitude greater than zero at every location in the space. As such, any reasonable combination of Hasegawa and Piwczyk cannot result, in any way, in the invention of claim 1.

Furthermore, Applicants respectfully submit that there is no motivation or suggestion to combine the teachings of these references.

The Examiner alleged at page 5 of the Office Action that “it would have been obvious ... to employ the flushing system as taught by Piwczyk [sic] into the exposure system/method of Hasegawa for the purpose of generating the radial gas flow toward the space between the projection lens and the substrate.” The Examiner went on to state “the purpose of doing so would have been to remove particles, gas debris on the surface of the substrate and thus to reduce the absorption of the projection beam light whereby the light transmission is increased and the quality of the images to be greatly improved.” However, Applicants respectfully disagree.

Specifically, one skilled in the art would clearly not be motivated to apply Piwczyk’s teachings to reduce the absorption of the radiation beam in Hasegawa because Piwczyk expressly teaches that the gas flow is directed from the inner annular grooves 14 in an upward direction through the chamber 3 and out of passage 11 to an exhaust or retrieval system in order to reduce debris from the substrate. (*See* Piwczyk, col. 9, lines 59-68 and FIG. 5). Clearly, Piwczyk’s process for removing particles or debris from the space adjacent the processed area of the substrate would increase the absorption of the radiation beam in Hasegawa because it would provide additional particles/debris in the path of the radiation beam. As such, Applicants respectfully submit that Piwczyk and Hasegawa teach away from their combination. As a result, Applicants respectfully submit that the combination of Piwczyk and Hasegawa is improper. (*See* MPEP 2145).

Claims 2-22, 27 and 29-31 are patentable over Hasegawa, Piwczyk and a combination thereof at least by virtue of their dependency from claim 1 and for the additional features recited therein.

Claim 23 is patentable over Hasegawa, Piwczyk and a combination thereof for at least similar reasons as provided above for claims 1 and 23. Namely, claim 23 is patentable over Hasegawa, Piwczyk and a combination thereof at least because this claim recites a method of manufacturing a device comprising, *inter alia*, flowing a radial flushing gas with a gas flushing system from a radial gas flow outlet arranged proximate an inner side of the gas flushing system that is adjacent a path of the beam of radiation toward an outer part of the substrate in an intermediate space between the gas flushing system and the substrate. As mentioned previously, the Examiner conceded that Hasegawa does not disclose, teach or suggest this aspect of claim 23 and Applicants argued that Piwczyk fails to disclose, teach or

suggest this aspect of claim 23. Therefore, any reasonable combination of Hasegawa and Piwczyk cannot result in any way in the invention of claim 23.

Furthermore, for the same reasons provided above, Applicants respectfully submit that there is no motivation or suggestion to combine the teachings of these references at least because these references teach away from their combination.

Claims 24-27 are patentable over Hasegawa, Piwczyk and a combination thereof at least by virtue of their dependency from claim 23 and for the additional features recited therein.

Accordingly, reconsideration and withdrawal of the rejection of claims 1-31 under 35 U.S.C. §103(a) based on Hasegawa and Piwczyk are respectfully requested.

Claims 1-31 were rejected under 35 U.S.C. §103(a) based on Hasegawa in view of Gerhard *et al.* (U.S. Pat. No. 6,936,825) (hereinafter “Gerhard”). The rejection is respectfully traversed.

Claim 28 is cancelled without prejudice or disclaimer, thus rendering moot the rejection of claim 28.

As conceded by the Examiner on page 7, lines 6-7 of the Office Action, Hasegawa does not disclose, teach or suggest the gas flushing system as recited in claim 1. The Examiner then relied on Gerhard as allegedly teaching this aspect of the claimed invention. Applicants respectfully disagree and note that the Examiner is not considering all the details of the claimed invention of claim 1.

Specifically, Gerhard does not disclose, teach or suggest a gas flushing system comprising a radial gas flow outlet arranged proximate an inner side of the gas flushing system that is adjacent a path of the patterned beam of radiation, the gas flushing system constructed and arranged to generate a radial gas flow through the radial gas flow outlet in an intermediate space defined between the gas flushing system and the substrate, wherein the radial gas flow has a radial velocity directed outwards in the space with a magnitude greater than zero at every location in the space.

Gerhard merely discloses a flushing gas supply 7 in communication with housing 1 via ducts 8. (*See* Gerhard, FIG. 1). Gerhard discloses that the gas is supplied in the space defined between lenses 2 in the housing 1. *Id.* Gerhard is however completely silent as to a radial gas flow outlet and the gas flushing system as recited in claim 1. Gerhard does not even hint at providing a radial gas flow in an intermediate space defined between a gas flushing system and a substrate. Gerhard is merely concerned with supplying flushing gas

into and out of a projection system. Therefore, any reasonable combination of Hasegawa and Gerhard cannot result, in any way, in the invention of claim 1.

Furthermore, Applicants respectfully submit that there is no motivation or suggestion to combine the teachings of Hasegawa and Gerhard.

Hasegawa merely teaches supplying flushing gas between the projection system and the substrate but is silent as to supplying flushing gas into and out of the projection system. By contrast, Gerhard merely teaches supplying flushing gas into and out of a projection system but is silent as to supplying flushing gas between the projection system and the substrate. Therefore, since Hasegawa and Gerhard are silent as to each other's features, Applicants respectfully submit that it would not have been obvious to modify one of these references in view of the other.

Claims 2-22, 27 and 29-31 are patentable over Hasegawa, Gerhard and a combination thereof at least by virtue of their dependency from claim 1 and for the additional features recited therein.

Claim 23 is patentable over Hasegawa, Gerhard and a combination thereof for at least similar reasons as provided above for claim 1. Namely, claim 23 is patentable over Hasegawa, Gerhard and a combination thereof at least because this claim recites a method of manufacturing a device comprising, *inter alia*, flowing a radial flushing gas with a gas flushing system from a radial gas flow outlet arranged proximate an inner side of the gas flushing system that is adjacent a path of a beam of radiation toward an outer part of the substrate in an intermediate space between the gas flushing system and the substrate. As mentioned previously, the Examiner conceded Hasegawa does not disclose, teach or suggest this aspect of claim 23 and Applicants argued that Gerhard fails to disclose, teach or suggest this aspect of claim 23. Therefore, any reasonable combination of Hasegawa and Gerhard cannot result in any way in the invention of claim 23.

Furthermore, for the same reasons provided above, Applicants respectfully submit that there is no motivation or suggestion to combine the teachings of these references.

Claims 24-27 are patentable over Hasegawa, Gerhard and a combination thereof at least by virtue of their dependency from claim 23 and for the additional features recited therein.

Accordingly, reconsideration and withdrawal of the rejection of claims 1-31 under 35 U.S.C. §103(a) based on Hasegawa and Gerhard are respectfully requested.

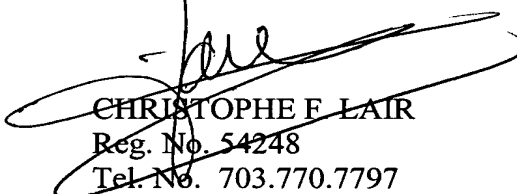
Applicants have addressed the Examiner's rejections and objection and respectfully submit that the application is in condition for allowance. A notice to that effect is earnestly solicited.

If any point remains in issue which the Examiner feels may be best resolved through a personal or telephone interview, please contact the undersigned at the telephone number listed below.

Please charge any fees associated with the submission of this paper to Deposit Account Number 033975. The Commissioner for Patents is also authorized to credit any over payments to the above-referenced Deposit Account.

Respectfully submitted,

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